ADEQ Arizona Department of Environmental Quality
Janice K. Brewer, Governor
Henry R. Darwin, Director

DRAFT FACT SHEET

Aquifer Protection Permit
Place ID 9676, LTF 58677
Significant Amendment
Asarco Ray Operations

The Arizona Department of Environmental Quality (ADEQ) proposes to issue an aquifer protection permit for the subject facility that covers the life of the facility, including operational, closure, and post-closure periods unless suspended or revoked pursuant to Arizona Administrative Code (A.A.C.) R18-9-A213. This document gives pertinent information concerning the issuance of the permit. The requirements contained in this permit will allow the permittee to comply with the two key requirements of the Aquifer Protection Program: 1) meet Aquifer Water Quality Standards at the Point of Compliance; and 2) demonstrate Best Available Demonstrated Control Technology (BADCT). BADCT's purpose is to employ engineering controls, processes, operating methods or other alternatives, including site-specific characteristics (i.e., the local subsurface geology), to reduce discharge of pollutants to the greatest degree achievable before they reach the aquifer or to prevent pollutants from reaching the aquifer.

I. FACILITY INFORMATION

Name and Location

Permittee's Name:	ASARCO LLC
Mailing Address:	ASARCO LLC - Ray Complex Box 8 Hayden Arizona 85235
Facility name and location:	ASARCO Ray Operations State Hwy. 177 Near Kearney, AZ Pinal County

Regulatory Status

The Notice of Disposal for this site was received on January 18, 1985. The initial aquifer protection permit (APP) application was received on March 25, 1994. An updated application was received on June 16, 1999. The individual APP was issued December 18, 2008. The AZPDES permit for this site, Mineral Creek tributary to the Gila River (AZ0000035), was re-issued on May 19, 2003. The Ray Concentrator and Elder Gulch Tailings Impoundment have already been issued an APP, Number P-102278. That APP may be merged with the Area-Wide APP at some point after issuance, with an “other” permit amendment.

This site is the subject of a Consent Decree between ASARCO Incorporated and the United States Department of Justice, entered into on January 23, 1998. This Consent Decree required improvements to the water quality of Mineral Creek. The main

provisions to be used to achieve this were the construction of a diversion tunnel, and the attainment of, and full compliance with an APP.

Facility Description

The ASARCO Ray Operations are located in eastern Pinal County, along State Highway 177, approximately ten miles to the north of Kearny. The site consists of an open-pit mine and associated rock deposition areas (RDAs), a mill that produces concentrate, and a solvent extraction-electrowinning (SX-EW) plant that produces refined copper cathodes from the leaching operations. Underground mining activities began in the area around 1880, and continued off and on until the mid-1940's. The Ray Mine has been in operation since 1911. In 1948 the Kennecott Copper Company consolidated the remaining mining operations and began the development of the open-pit mine. ASARCO purchased the mine from Kennecott in 1986. The Ray porphyry copper deposit lies within the drainage of Mineral Creek, which bisected the deposit until late 1972, when the water of the creek was diverted around the mine via an 18,181 foot long diversion tunnel, which was driven into the Dripping Springs Mountain Range located to the east of the mine. A 13,300 foot extension of the diversion tunnel was completed in 2002, to better isolate the waters of Mineral Creek from mining, milling, and leaching operations.

Mining operations are ongoing, 24 hours a day, seven days a week, and progress through a sequence involving drilling, blasting, loading and hauling activities. The current mining rate from the open pit averages about 256,000 tons of ore and waste rock per day. Based upon the current mining rate and the estimated ore reserves, the Ray Operations are projected to be active until the year 2044.

The copper sulfide ores mined at the Ray Mine are taken to one of two crushing facilities on-site, and then conveyed to the Ray Concentrator or railed off-site to the Hayden Concentrator for processing prior to shipment to a smelter. The remaining material consists of leach rock material, which is taken to prepared RDAs and leached; and barren rock, which is hauled to separate RDAs, where no leaching presently occurs.

The RDAs are typically constructed by end-dumping ore from trucks in 25 to 100 foot lifts. Ultimate RDA thicknesses may exceed 1,000 feet. Leach solution or raffinate is applied to the RDAs by flooding bermed cells on top of the RDAs; or spraying, trickling, or dripping solution onto the top of the RDAs. Solution can also occasionally be applied to an RDA face. Leach solution percolates through the RDA, reacting with the copper bearing ores, and ultimately flows out the toe of the RDA as pregnant leach solution (PLS). The PLS is captured by a downgradient collection system, typically an impoundment, and piped to the SX-EW Plant for the production of refined copper cathodes.

The Ray Operations are located within the Mineral Creek drainage, a tributary of the Gila River, between the Dripping Spring and Tortilla Mountain ranges. The topography in the area is rugged, ranging from about 5,100 feet above mean sea level

(amsl) northeast of the Ray Operations to about 1,800 feet amsl at the confluence of Mineral Creek and the Gila River south of the site.

Amendment Description

This significant amendment application was submitted to permit new facilities, modify permitted facilities, consolidate permitted facilities, remove/close permitted facilities, increase permitted rock deposition area (RDA) elevations, remove alert level wells, revise selected sections of the permit (such as BADCT descriptions and operations and maintenance), and make administrative corrections to the permit.

Additional later requests made by ASARCO (August 16, 2012 submittal) include modifications to merge the Elder Gulch Permit (P-102278) into the ASARCO Ray Operations Permit (P-100525), and facility changes for Elder Gulch permitted facilities; and (September 19, 2012 submittal) to insert radionuclide ALs and AQLs into the consolidated permit.

Based upon the analyses performed, the concentrations of constituents remaining in soils beneath the former impoundments do not pose a threat to groundwater quality. The applicant has eliminated, to the greatest degree practicable, any reasonable probability of further discharge from the facility, and of exceeding the aquifer water quality standards at the point of compliance.

II. BEST AVAILABLE DEMONSTRATED CONTROL TECHNOLOGY (BADCT)

The Ray Operations are divided into three sub-areas: A, B, and C Sub-area B consists of the area underlain by the capture zone, characterized as the "passive containment" created by the Ray open pit. Sub-area A is the mine area located hydrologically upgradient of the passive containment, and Sub-area C is the mine area located hydrologically downgradient of the passive containment. BADCT has been determined in accordance with the ADEQ Arizona Mining BADCT Guidance Manual. All facilities at the Ray Mine are existing facilities, except the Diversion RDA, Diversion Structure, Mineral Creek Collection Impoundment, and Retention Basin.

The passive containment created by the Ray open pit has been deemed to satisfy the requirements of A.R.S. § 49-243(G). The passive containment created by the open pit is hydrologically isolated to the extent that it does not allow pollutant migration from within the capture zone. This passive containment is an integral part of the BADCT for all facilities located within Sub-area B, which is defined by the capture zone. Due to the isolated nature, within the Mineral Creek Basin, of the facilities located in Sub-area A, any groundwater flow originating from Sub-area A will flow into the capture zone of the passive containment created by the open pit, and the passive containment is therefore also an integral part of the BADCT for the facilities located within Sub-area A. BADCT evaluation of the existing facilities located in Sub-area C involved the following factors:

Current discharge control technology (DCT) and site factors;
Aquifer loading;
Technically feasible alternative DCTs; and,
Cost vs. discharge reduction.

BADCT is supplemented by a required inspection and maintenance program, and groundwater monitoring at the applicable points of compliance.

III. COMPLIANCE WITH AQUIFER WATER QUALITY STANDARDS

Monitoring and Reporting Requirements

The applicant has requested that all sampling, except for radionuclides, be performed on a quarterly basis, and that radionuclide monitoring not be required at the former Elder Gulch wells, in conformance with the previous permit.

ADEQ has also approved the removal of benzene, ethylbenzene, toluene, xylenes, aluminum, iron, total petroleum hydrocarbons, and silver from the monitoring program.

The applicant has requested, and ADEQ approves, the removal of former Elder Gulch well R-5 from the monitoring program. This is an upgradient well, and no longer serves any significant purpose in the consolidated permit.

The applicant has requested, and ADEQ approves, the removal of the alert level wells from the consolidated permit. These wells, R-13, R-14, and R-24, are all located within the pollutant management area, and serve no regulatory purpose.

ADEQ has also removed point of compliance wells PC-1 and R-1 from the monitoring program, as they are not necessary to either the ASARCO Ray Operations permit or the Elder Gulch permit monitoring. Other wells adequately monitor downgradient impacts from the Elder Gulch Tailings Impoundment and the Ray Operations Area facilities.

The radionuclide results for POC wells R-18, R-19, and R-22, and the proposed ALs and AQLs submitted as a part of the amendment, appear reasonable, and have been incorporated into the biennial monitoring table.

Ambient monitoring will be required for some constituents. This requirement will be added to the compliance schedule and in the body of the permit.

Groundwater movement generally is from areas of higher topographic elevation, associated with the crests of the drainage divides, to lower areas near Mineral Creek. Some alluvium of higher hydraulic conductivity occurs in the center of the drainage. The depth to groundwater within the basin varies from more than 100 feet, to tens of feet along Mineral Creek. The groundwater gradient within the basin flows from

areas of higher topography to lower topography (toward the center of the basin), and downstream. The POC wells have been installed in the vicinity of the furthest downgradient facilities in Mineral Creek, immediately past the Mineral Creek Retention Basin, and in the vicinity of Goat Ranch Lined Impoundment. The Retention Basin is designed to temporarily store stormwater from the 100-year, 24-hour storm event, and as the final temporary storage for fluids from unforeseen emergency spills, from Area C facilities. The 77 acre-foot Retention Basin has a 2500 gpm pumping system designed to remove flows for the 47 acre-foot design 100-year, 24-hour storm event within 5 days.

Point(s) of Compliance (P.O.C)

POC Locations	ADWR Registration Number	Latitude (North)	Longitude (West)
R-18	55-534853	33º 07’ 34”	110º 58’ 35”
R-19	55-534852	33º 07’ 34”	110º 58’ 35”
R-22	55-543974	33º 07’ 35”	110º 58’ 41”
R-2	55-525710	33º 07' 17.3"	110º 58' 14.9"
R-2a	55-533677	33º 07' 09.8"	110º 57' 53.7"
R-3	55-525711	33º 07' 07.5"	110º 57' 32.3"
R-4	55-525712	33º 07' 03.9"	110º 57' 07.0"
R-4a	55-534346	33º 07' 40.8"	110º 56' 56.3"

IV. STORM WATER and SURFACE WATER CONSIDERATIONS

The project area is contained within the Mineral Creek hydrologic basin. There are no nearby surface water bodies. Facilities are designed to contain the 100-year, 24-hour storm event, and still maintain appropriate freeboard. Stormwater falling in Sub-area A, upstream of the Diversion Structure, will be diverted by the Mineral Creek Diversion Tunnel, and discharged into the Retention Basin downstream of Sub-area B. Stormwater falling in Sub-area A, downstream of the Diversion Structure, will report to the Ray Mine Open Pit, along with stormwater runoff from Sub-area B. Stormwater collected in the Ray Mine Open Pit will be recycled for use at the mine. Stormwater commingled with PLS in the Ray Mine Open Pit will be processed in the SX/EW Plant prior to recycling. Stormwater falling outside the impoundments, but within Sub-area C is routed into the Retention Basin. The facility does not have MSGP coverage and that all Stormwater related to the facility is managed under the AZ0000035 Individual AZPDES permit.

V. COMPLIANCE SCHEDULE

Seven items are required to be submitted pursuant to Section 3.0 of the updated permit.

VI. OTHER REQUIREMENTS FOR ISSUING THIS PERMIT

Technical Capability

ASARCO Incorporated has demonstrated the technical competence necessary to carry out the terms and conditions of the permit in accordance with A.R.S. § 49-243(N) and A.A.C. R18-9-A202(B). Consultants and contractors hired to design and/or build facility upgrades have also demonstrated the appropriate technical competence.

ADEQ requires that appropriate documents be sealed by an Arizona registered geologist or professional engineer. This requirement is a part of an on-going demonstration of technical capability. The permittee is expected to maintain technical capability throughout the life of the facility.

Financial Capability

The permittee shall maintain financial capability throughout the life of the facility. The closure and post-closure costs are estimated to be $6,214,892 and $4,608,000 respectively. The financial demonstration shall be provided within 90 days of permit issuance and is included in the compliance schedule.

Zoning Requirements

Mining activity of greater than five contiguous acres is exempt from zoning requirements pursuant to A.R.S. § 11-812.

VII. ADMINISTRATIVE INFORMATION

Public Notice (A.A.C. R18-9-108(A))

The public notice is the vehicle for informing all interested parties and members of the general public of the contents of a draft permit or other significant action with respect to a permit or application. The basic intent of this requirement is to ensure that all interested parties have an opportunity to comment on significant actions of the permitting agency with respect to a permit application or permit. This permit will be public noticed in a local newspaper after a pre-notice review by the applicant and other affected agencies.

Public Comment Period (A.A.C. R18-9-109(A))

The aquifer protection program rules require that permits be public noticed in a newspaper of general circulation within the area affected by the facility or activity and provide a minimum of 30 calendar days for interested parties to respond in writing to ADEQ. After the closing of the public comment period, ADEQ is required to respond to all significant comments at the time a final permit decision is reached or at the same time a final permit is actually issued.

Public Hearing (A.A.C R18-9-109(B))

A public hearing may be requested in writing by any interested party. The request should state the nature of the issues proposed to be raised during the hearing. A public hearing will be held if the Director determines there is a significant amount of interest expressed during the 30-day public comment period, or if significant new issues arise that were not considered during the permitting process.

VIII. ADDITIONAL INFORMATION

Additional information relating to this proposed permit may be obtained from:

Arizona Department of Environmental Quality
Water Quality Division – APP & Drywell Unit
Attn: Richard Mendolia
1110 W. Washington St., Mail Code 5415B-3
Phoenix, Arizona 85007
Phone: (602) 771- 4374